Running head: A Fall Injury Reduction Initiative

A Fall Injury Reduction Initiative for Older Adults

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Certification Statement

I herby certify this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

Signed: _____

Abstract

The problem was that Bath Fire Department experiences a significant number of incidents where senior adults (65 years of age and older) fall resulting in injury. The purpose of this research was to reduce the number of fall incidents involving older adults in Bath Township. Utilizing a literature review and action research procedures, including interviews, personal communications, conducting a survey of almost eighty fire departments, an analysis of Ohio's trauma registry and Bath Fire Department EMS calls for service, this research paper will answer the following questions: What are the factors or conditions causing the older adults to sustain fall injuries in Bath Township? What are the characteristics of available fall injury prevention programs and what advantages to Bath Township does each program offer? What content elements should be included within Bath Township's fall injury reduction initiative?

The results of the literature review and research indicate that older adult falls are a risk for all communities. The fire service claims it's an all hazard response agency and for the most part, it is. However, the main focus of identifying risk is on fire hazards. The main focus should be on community risk reduction - which includes the older adults as they will fall and will be injured. The fire service has the ability to help reduce the number of older adult falls.

Recommendations include establishing a steering committee to oversee a fall injury reduction initiative for older adults in Bath Township. The steering committee will identify risks, prevention and education associated with the falls. The initiative and steering committee will promote the health, safety and the well-being of older adults and improve the quality of life in Bath Township.

Table of Contents

Appendices

A Fall Injury Reduction Initiative for Older Adults

Introduction

One out of three older adults (over the age of sixty-five) experience a fall every year and two thirds of those people will fall a second time within six months. In either case, falls are one of the top three reasons older adults will call 9-1-1 for Emergency Medical Services (EMS) (Taigman, Tait, 2009). The problem is that Bath Fire Department experiences a significant number of incidents where senior adults fall resulting in injury.

The purpose of this research is to reduce the number of fall incidents involving older adults in Bath Township. Utilizing action research, this research paper will answer the following questions: What are the factors or conditions causing the older adults to sustain fall injuries in Bath Township? What are the characteristics of available fall injury prevention programs and what advantages to Bath Township does each program offer? What content elements should be included within Bath Township's fall injury reduction initiative?

Background and Significance

The Bath (suburb of Akron) Fire Department is a combination/suburban Fire Department located between Akron and Cleveland, Ohio. Averaging approximately 1,200 calls for service per year, the department protects twenty-three square miles with a bedtime population of 10,000 people that swells to between 20,000 and 30,000 during the weekday business hours. With a total roster of seventy, the department employs ten career personnel, thirty part-paid/on-call home based response personnel (also eligible to work fill-in shifts at either station) and thirty personnel who only work fill-in shifts. The department operates out of two stations. A main station houses two engines, a 3,000-gallon water tender, a heavy rescue, two advanced life support medical units and four staff vehicles. The main station is co-located with the Township

Administration, Zoning, Police, Service/Roads, Dispatch Center and Parks Departments. The second station is a shared property, building and operation with another combination department to our south. This station houses two (one spare) advanced life support medical units, one engine and water rescue vehicle with a boat. The department provides services including, but not limited to, fire suppression, investigations, advanced life support (including hospital transport), special/technical operations, inspections, public education, marketing and training. The department participates in a reciprocal automatic aid agreement with five other fire departments and provides resources for countywide (Summit County) Special Operations Response Team including technical/collapse rescue, water rescue, rope rescue and hazardous materials. The department maintains and enjoys the combination atmosphere as the career and part-paid personnel supplement each other with the majority of the responders living in the community. In a small tight-knit atmosphere such as Bath Township, the fire department is fortunate to be one of the many focal points in the community.

While completing the pre-course assignment for the Executive Analysis of Community Risk Reduction class, this researcher discovered that in Bath Township from January 1, 2007 through December 31, 2009, the three highest areas of injury risk (falls, motor vehicle crashes and struck by object/person) resulted in 896 patients. Of the 896, ranking number one was fall injuries with 557 (62%) patients. Of the 557, 434 (78%) of those patients were older adults (over the age of 65), resulting in an EMS response 2.5 times a week for the Bath Fire Department. The Bath Fire Department has always delivered a traditional fire-based prevention and public education program. The target audience for these programs has been the primary education level (pre-school through 6th grade students) schools in the Township. Although the young child population (age five and under) is one of the four populations known to be at risk from fire, the

department does not address the older adult population, people with disabilities and people living in poverty (U.S. Department of Homeland Security, pre-course assignment, 2009, p. 40). These same four population groups also represent those that are at risk for many other preventable incidents and injury. In 2009, Bath Township's population was 10,190 including 1,732 (17%) older adults compared to the 11% of older adults in the United States (Sperling's Best Places, 2009). In a USA Today newspaper article, Overberg (2010) reported the median age for the United States was 36.8. The state having the highest median age of 42.2 was Maine and the lowest at 28.8 was Utah.

By request, the Bath Fire Department will deliver a public education program to any specific business or group within the Township. The department has been awarded money from the United States Fire Administration (USFA), Fire Prevention and Safety Grant. The grant money was used for the purchase of smoke and carbon monoxide detectors and residential lock boxes. Upon request from the citizens, on duty fire-fighters installed a detector and/or lock box at their home. This program proved to be very successful and beneficial.

Chapter six of the National Fire Protection Association (NFPA) standard 1201, Providing Emergency Services to the Public (2004), states the emergency services organization should deliver educational programs for fire, emergency medical services (EMS), other disasters and threats. The programs should include development, delivery, evaluation and revisions as necessary. These programs should be delivered to the community including organizations, interest groups, corporations and other governmental agencies. The Bath Fire Department has not assessed and identified the community's hazard risks and the population(s) that would be most affected. Not knowing the identified risks, a community risk reduction initiative specific to older adult fall injuries is not in place.

This applied research project will relate to one of the five goals of the United States Fire Administration (USFA) Strategic Plan for years 2009-2013: to "Reduce risk at the local level through prevention and mitigation" (USFA, 2009, p. 15). This project will relate to the third unit of the Executive Analysis of Community Risk Reduction student manual (Department of Homeland Security [DHS] 2009): Intervention, Program Design and Evaluation.

Literature Review

This literature review will report what others have written about falls involving older adults (65 or older). One of the biggest threats to an older adult is the fear of falling. A person who falls will come to rest on a lower level, usually the floor or ground and sometimes will strike a body part that will help break the fall. About one half of the older adults who fall will not be able to get back up without assistance. The independence of older adults is threatened by the fear of falling and most believe the fall is just part of the aging process. Older adults who fall and have no obvious injury, will be reluctant to report the fall for fear that their activities will be decreased or they will be sent to a nursing home or other assisted care facility (Merk, 2005). However, older adults should be asked at least once a year if they have fallen.

Older adults lead the way when it comes to fatal and nonfatal injuries as a result of a fall in the United States. Each year, thirty percent of older adults will fall. The thirty percent rises to almost seventy percent for adults who have fallen in the previous year and about one half of nursing home residents will fall each year (American Geriatrics Society, n.d.). These falls will result in more than $20 billion annually for treatment of the injuries sustained in the fall with a projection of $54.9 billion annually by the year 2020 (American Academy of Orthopedic Surgeons, [AAOS] 2009). The consequences of a fall can be just as serious as suffering a stroke, but falls and fall injuries are more common (Tinetti, 2009).

Medical treatment will be focused on the most common injuries from a fall, which are: head injuries, wrist injuries, spine injuries and hip fractures. Falls can happen to anyone, anywhere and at any time, but older adults usually fall while at home going about their day-to-day routines. Covering all age groups, the National Safety Council (2009) reports unintentional falls caused, or led to, just under 19,000 deaths in 2004. Most at risk are the older adults resulting in 80% of those who receive a fatal injury as the result of a fall.

Twenty-one thousand seven hundred people died as a result of a fall in 2007 with 7.9 million suffering injuries from a fall. Of the 7.9 million, 1.8 million were older adults and required an emergency room visit. In 2007, $625 billion or $2,100 for every person in the United States was the cost for unintentional injuries. For the year 2001, hospital emergency rooms received more than 1.6 million visits from older adults, which resulted in 388,000 hospital admissions as the result of fall injuries (Friese, 2008).

In Minnesota, between 1999 and 2006, the state ranked the third highest for older adults that died as a result of a fall. More than 100 people die each year as a result of a fall while living in a nursing home (Howatt and Louwagie, 2009). Usually, after a fall, the older adult will start to decline as they feel the end of life is near and often times will see a dramatic change in their lives. Falling is as serious as heart attacks and strokes, but is not known to the average person on the street (Howatt and Louwagie, 2009).

There are numerous reasons, also known as risk factors, as to why the older adult will fall. Ongoing or newly diagnosed health problems such as heart disease, general weakness, poor balance and/or vision, problems with the feet, muscles or other bones, dementia, Parkinson's disease, diabetes, new or changes in medication or a decrease in blood pressure from standing up to fast, slippery floors, throw rugs, trip hazards, clutter, poor lighting or lack of grab rails can

contribute to a fall. The most common of all these are: 1. problems with balance, 2. taking four or more medications, 3. feet or foot-wear problems, 4. drop in blood pressure, 5. vision issues and 6. tripping hazards. Tinetti (2009) explains if an older adult has no risk factors, they have a 10% chance of falling; one risk factor equals a 20% chance, two risk factors equals a 30% chance, three risk factors equals a 60% chance and more than four risk factors equals an 80% chance of falling. MERK (2005) describes the cause of a fall as a complex interaction of intrinsic, extrinsic, situational factors and further complications from a previous fall. Intrinsic factors, or age related changes, include stability, balance and muscle activation, vision changes, chronic pre-existing medical conditions and prescription medications. Extrinsic, or environmental factors include those times when the older adult must maintain postural control and mobility due to an unstable walking surface (eg: wet, slippery, uneven, unfamiliar with area). Situational factors include activities and/or decisions by the older adult such as wearing slippery socks, high heels, being in a hurry or trying to negotiate through the home at night or when not fully awake. Complications from a fall include the fear of falling and increased risk of injury, hospitalization, death, relocating to an institution and deteriorating quality of life.

We cannot change the aging process, but many of the risks of falling can be decreased and it must begin with prevention. The American Geriatrics Society (AGS) (2001) recommends the older adult get a "falls check up" with their doctor or other health care provider. This session must begin with an admission if a previous fall has occurred and the factors that may have contributed to the fall. This visit should include a check of leg strength, including balance and function, basic vital signs (blood pressure, pulse, heart rhythm), a vision test and an evaluation of mobility/walking ("Get Up and Go Test"). The older adult will stand up from a seated position without using their arms, walk several paces, and then return to the chair. Those who complete

the test without difficulty will not need further assessment. Those who present with unsteadiness or difficulty will require further assessment. All medications should be reviewed at this time for the proper dose or any changes. Medications are often mentioned in the risk factors for falling. Alcohol use and/or abuse are not. Many of the effects of medications and alcohol are the same. The Clermont Ohio General Health District (2010) reports that 17% of older adults have an alcohol abuse problem and often times the older adult is not asked if they have used alcohol.

Lipsitz (2009) reports that fewer doctors are specializing in geriatrics. There were 7,128 geriatricians in 2008 and by 2030 the need will be 36,000. In 2003, only 167 doctors were seeking the specialty and that number dropped to 91 in 2007. The older adults' complex medical issues combined with their psychological and social needs is not attractive to a graduating physician who also believes the compensation would not be adequate for the time spent with each patient.

In addition to the risk assessment of the older adult and identifying proactive measures to maintain good health, this researcher found numerous checklists to help identify and correct environmental risks. Bakker (2005) from the Weill Medical College of Cornell University developed the "Gerontological (study of aging) Environmental Modifications (GEM) Assessment." This document covers all functional areas/rooms of a home and includes 90 check-box assessments from flooring to lighting, windows and shades, furniture and storage, sink and toilet access, grab bars and hand rails, as well as climate control and excess clutter, just to name a few. All seem to be common sense items, but it's best if a family member or other party assist the older adult with the assessment. More importantly, is the follow up and necessary environmental alterations to decrease the risks of a fall.

The literature review provided no shortage of information relative to falls (fall injuries) in the older adult population. The falls occur often, they cause severe injuries, death, and un-needed stress for family, loved ones and the nation's health care system. The reasons, risks or causes of the falls can be lengthy, sometimes complex and most can be predicted, prevented or managed. The literature revealed numerous sources, programs and interventions to assist in creating an initiative to reduce the number of older adult fall injuries.

Procedures

The purpose of this action research is to reduce the number of fall incidents involving older adults in Bath Township and answer the following questions: What are the factors or conditions causing the older adults to sustain fall injuries in Bath Township? What are the characteristics of available fall injury prevention programs and what advantages to Bath Township does each program offer? What content elements should be included within Bath Township's fall injury reduction initiative? Before keying on the specifics of Bath Township and to gain a better perspective on senior falls, this researcher started with a big picture approach and then narrowed the focus to Bath Township. The procedures included a personal interview, personal communications, a survey, an analysis of state (Ohio) and local (Bath Township) older adult falls data.

While brainstorming research paper problem statements with other students, one student suggested this researcher check with Grand Forks North Dakota because they had a fall prevention program for older adults. On March 15, 2010, this researcher called Grand Forks City Hall and asked to be directed to the person who could answer a few questions about their fall prevention program for older adults. This researcher was advised that the city does not have a program and was directed to call The University of North Dakota Department of Occupational

Therapy, School of Medical and Health Science. On the same day, this researcher made the call and spoke with Ms. Cindy Janssen, Assistant Professor.

On April 15, 2010, this researcher called the Summit County Ohio, Department of Health and Human Services, Adult Protective Services, hoping to discuss fall prevention for older adults. As adult protective services are specific to abuse, neglect and exploitation of older adults, this researcher was directed to call Mr. Kirk Davis, Vice-President of Planning and Quality Improvement for the Area Agency on Aging. On this same date, a call was made to Mr. Davis, who agreed to a personal interview. The interview took place on April 30, 2010 at the Cracker Barrel restaurant in Copley Township, Ohio at 8 o'clock in the morning. The purpose of this interview was to narrow the focus of the original research questions.

The next research procedure was a fifteen-question survey (Appendix A) sent to eighty fire departments (Appendix B). Recipients included all fire departments in Summit County, Ohio and all departments represented in this researcher's Executive Development and Community Risk Reduction classes held at the National Fire Academy. The survey was e-mailed on May 26, 2010 with a request for the survey to be completed by June 18, 2010. Survey Monkey (www.surveymonkey.com) was used to create, distribute and collect the data from the survey. The purpose of this research was two-fold. First, to see what other fire departments are doing relative to prevention or mitigation of older adult falls. Second, to obtain information specific to a family-related, older adult fall incident. Fifty-nine (73%) of the surveys were completed. Of the fifty-nine, twenty-three (39%) of the departments were career/paid; two (3%) were volunteer/non-paid; ten (16%) were combination, career/non-paid volunteer; twenty-five (42%) were combination, career/part-paid. Fifty-four (91%) of the departments provide emergency medical services (EMS).

The next procedure included several personal (phone and e-mail) communications with Mr. Tim Erskine, Chief of Trauma Systems Research at the Ohio Department of Public Safety. These communications took place between April 20, 2010 and June 11, 2010. We discussed and reviewed Ohio's Trauma Acute Care Registry (TACR) as it relates to older adult fall statistics. The purpose of this research was to obtain the most recent and specific older adult fall injury statistics for Ohio. Statistics included were age, gender, cause of the fall, and location of the fall, hospital emergency department disposition, and hospital admittance disposition and hospital discharge information.

The last procedure was to review Bath Fire Department's emergency medical service (EMS) call for service data between January 1, 2007 and December 31, 2009. The purpose of this research was to analyze all elements specific to older adult fall incidents in Bath Township.

This researcher did experience some limitations during the research procedures. The County's Area Agency on Aging and the State of Ohio were unable to provide specific older adult fall data specific to Summit County or Bath Township.

The survey tracked how many fire departments completed the survey; it did not track which departments. Additional demographics about the department and community should have been asked. Rather than asking for additional comments to certain questions, additional and more specific answers could have been listed. Asking the respondents to answer questions based on previously answered questions could have caused confusion.

Ohio's TACR is limited by the number of hospitals that submit data to the TACR, as well as the accuracy of the data that is submitted. The TACR only collects data for a severely injured person, which has been defined as hospital admittance for forty-eight hours or more. Any person

not meeting this criteria or who dies at the scene of the incident is not included. The TACR did not have an accurate account of cost data associated with older adult fall injuries.

The review of the Bath Fire Department EMS calls for service was very time consuming - much more than this research had anticipated. Whether it was an overall lack of data entry or inaccurate data entered in the Firehouse Software Records Management Program/System, some reports generated for the three-year period were incomplete. This caused additional research and a clarification of records and information. This researcher hoped to identify the exact cause of the older adult fall injuries in Bath Township. That information was not available.

Results

The research did provide specific answers to the research questions. What are the factors or conditions causing the older adults to sustain fall injuries in Bath Township? What are the characteristics of available fall injury prevention programs and what advantages to Bath Township does each program offer? What content elements should be included within Bath Township's fall injury reduction initiative?

A conversation was held with the Assistant Professor, Ms. Cindy Janssen, from The University of North Dakota Department of Occupational Therapy, School of Medical and Health Science. This researcher explained the reason for calling. Ms. Janssen indicated the city of Grand Forks does not have an older adult falls program in place. She reported that any and all statistics will indicate a growing problem with older adult falls and it is a main topic in the Gerontics (relating to the last phase of life) class for occupational therapy students at the university. Ms. Janssen said the best place to start for older adult fall prevention is to conduct an assessment of the older adult and their home. She believes the best qualified person to do this would be an occupational therapist. The occupational therapist is a professional, specifically

trained to bridge the gap between the older adult, the environment and all activities associated with the older adult. Specific assessment of the person would include balance, mobility, how one dresses (including how they get dressed and undressed), and hygiene, grooming, cooking, eating and sleeping. The home and day-to-day activities would be assessed for potential fall hazards. Not all hazards would need to be eliminated, but might require a slight alteration in order to make it safe for the older adult. Ms. Janssen was helpful and it was a pleasure speaking with her.

The interview with Mr. Davis from the Area Agency on Aging focused on four questions:

1. Can you provide an overview of your agency?

The Area Agency on Aging is one of Ohio's twelve regions of the Department of the Aging covering Summit, Portage, Stark and Wayne counties. Mr. Davis said that in 1965, Congress passed the Older Americans Act and it required all states to establish a single state agency to implement and oversee a statewide aging program. In 1966, Ohio established the Division of Administration on Aging. Eventually, the twelve regions were created. The state's population is approximately 11,500,000 and roughly 1, 500,000 are older adults. The four counties covered by the Area Agency on Aging make up 10% (150,000) of the state's older adult population. Mr. Davis said his agency's main focus is their Passport System. Passport is designed to provide services to the older adult so they can remain at home instead of being admitted to a nursing facility. Eligibility for Passport is based on two main factors: if the older adult needs assistance with everyday activities and if they need financial help for in home services. He said that in home health care is one-third the cost of a nursing home. The agency carries a $60 million annual budget and $50 million is for Passport. The agency employs 160 people and 60 of those employees are

assigned to 65 Passport cases each. For the year 2009, the agency conducted 1,475 assessments and made 536 enrollments into the Passport System.

2. Are there older adult fall statistics available for Summit County and/or Bath Township?

Mr. Davis said he was not aware of any statistics for Summit County.

3. Can another governmental agency, such as a Township, request services from your agency?

Mr. Davis said the agency is open to all referrals from other governmental agencies. He said specific to receiving a referral for an older adult fall, more than likely it would come from an emergency medical service (EMS) provider. The agency would want either the patient contact information or the ability to reach a family member. These requests would not be a priority for the agency and would probably have a two to three week wait time. A nurse would make the initial patient consultation and there would be no fee. Recommendations would be made to the patient and hopefully a family member. The agency could also offer other services with an applicable fee. If an outside contractor would be needed for home alterations or to install safety/engineering controls, that would be coordinated and paid for by the family.

4. Does your agency provide adult fall injury prevention education or mitigation?

Mr. Davis reported there is no specific education program for older adult falls, either pre-fall or post-fall.

The results of the fire department survey are broken down by each question, the response and additional comments as indicated. The first two questions were demographic related and described in the procedures section. Question three asked, "Does your fire department or other governmental agency provide fall injury prevention/education (pre-incident) to the older adult

(65 or older) population in your community?" Of the fifty-nine respondents, ten (17%) do provide pre-incident fall injury prevention/education. Thirty-seven (63%) departments indicated they do not and of those, seven (12%) stated that another agency within their political subdivision does provide fall injury prevention/education. Some of the agencies listed were: senior centers, parks and recreation, health departments and local hospitals. Twelve (20%) were not sure if another agency did or not.

Question four asked the same as question three except "Post Incident." Forty (67%) departments do not provide post incident prevention/education. Four (6%) departments do, one (1%) department said they will refer to another agency and fifteen (25%) said they do nothing at all.

Question five asked, "Does your fire department provide fire prevention/education to the older adult population in your community?" Fifteen (25%) departments responded that they do on an annual basis. Thirty-one (52%) stated only by request. Twelve (20%) departments do, but only to target groups such as nursing homes and assisted living facilities. Four (6%) departments do not provide programs to the older adults. Some additional comments listed with the answers to this question included: budget cuts have reduced these programs; older adults are contacted through community events and a church/ministry alliance.

Question six, "Does your fire department provide prevention/education to the school aged children in your community?" Fifty-six (95%) departments responded that they do and three (5%) stated they do not.

Question seven asked, “Do you (to the person completing the survey) have an older adult in your family, immediate or otherwise?” Forty-seven (81%) answered that they do, eleven (19%) said they do not and one person skipped the question.

Questions eight through twelve were for those who answered in the affirmative on question seven, which were forty-seven people. Question eight asked, "Do you fear your older adult family member could fall?" Forty-three (94%) people indicated they were fearful, three (6%) were not and one person skipped the question.

Question nine asked, "Do you know if this family member has sustained a fall within the last twelve months?" Twenty-three (48%) said no and twenty-two (46%) said yes. Of the twenty-two who said yes, nineteen (86%) said the older adult was injured from the fall. Three people were not sure if a fall had occurred.

Question ten, "If you answered yes to question nine, do you know if the fall could have been prevented?" Six (27%) people said no, seven (32%) said they were not sure and nine (41%) said it could have been prevented. Additional comments listed as to how the fall may have been prevented included: a better understanding of the older adult's limitations, better supervision, not climbing a ladder, provide a fall-safe environment, use a walker, understand ramifications of a fall and a better understanding of the surroundings.

Question eleven asked, "If you answered yes to question nine, was there some type of post incident fall prevention/education follow up offered or provided for the older adult?" Four (17%) people were not sure, seven (30%) said yes and twelve (52%) said no.

Question twelve was a follow up to eleven asking, "Who provided the post incident follow up?" Two (20%) said another family member, six (60%) said a primary care physician and two (20%) said a home health care type agency. Another option available was a community-based agency or program - it received zero responses.

Question thirteen; fourteen and fifteen were open to all respondents. Question thirteen asked, "Would you agree that your fire department is an all hazard response agency?" One person skipped the question; one (1%) person said no and fifty-seven (98%) people said yes.

Question fourteen, "Does your fire department provide all hazard mitigation (prevention; reduce or eliminate risk) for the community?" Three people skipped the question, nineteen (34%) said they do not and thirty-seven (66%) said they do.

Question fifteen asked, "Are you familiar with the United States Fire Administration's Community Risk-Reduction Model?" Thirty-nine (66%) people said they were, six (10%) said they were not and fourteen (24%) said they were not but they would look into the model.

This procedure was beneficial as it provided this researcher with a snap shot of what others in the fire service are doing, or not doing, to address older adult falls. More importantly was the personalized responses, experiences and comments involving loved ones from their families.

The data obtained from Ohio's TACR was lengthy and very detailed. At first glance, there were more than 80,000 fall victims over the age of sixty-five in the data base and it was clear that falls were the number one cause for a serious injury admittance to a hospital. For the year 2009, there were 7,003 older adult fall victims admitted to a hospital for at least forty-eight hours. The median age was eighty-two with 4,822 females, 2,177 males and four of unknown gender. The data listed twenty-nine possible causes of the fall. The top five causes were: 1. Fall from other (person fell from at least the standing position): 2,792 (39%). 2. Unspecified fall (the victim did not know what happened): 1,823 (26%). 3. Fall on stair or step: 747 (10%). 4. Fall against another object: 264 (4%). 5. Fall from bed: 225 (3%). The most popular place to fall was at home with 4,758 (68%) incidents. This was followed by residential institutions at 837 (12%), an unspecified location at 753 (11%) and 393 (6%) at a public building.

Of the 7,003 patients who visited an emergency room, their dispositions were as follows: 4,704 (67%) admitted to a regular floor and 1,323 (19%) to intensive care with an average stay of four days. Surprisingly to this researcher, only 157 (2%) went directly to the operating room from the emergency room. The average length of stay in the hospital was six days. Upon discharge from the hospital, 3,633 (52%) patients went to an extended care facility, nursing home or skilled nursing facility. Of those, 1,601 (23%) went to their place of residence, 410 (6%) to a rehabilitation facility, 308 (4%) to their place of residence with on-site health care and 284 (4%) succumbed to their injuries.

The review of the Bath Fire Department EMS calls for service between January 1, 2007 and December 31, 2009 revealed 2,805 incidents and 2,784 patients. Of those patients, 2,242 (80%) patients were transported to the local hospitals and 1,226 (44%) patients were males and 1,558 (56%) were females. The number one age group of both male (230, 8%) and female (357, 13%) patients was between eighty and eight-nine years old. The average age of the patient for this three year period was fifty-eight.

The three highest areas of injury risk resulted in 896 (32%) patients. The number one cause of injury for all ages was falls, accounting for 557 (62%) patients. The second leading cause of injury for the three-year period was motor vehicle crashes resulting in 308 (34%) patients. The third cause was persons who were struck by another object resulting in thirty-one (4%) patients.

Of the 557 fall injury patients, 434 (78%) were older adults and 279 (64%) were females with almost half of the patients (125, 45%) between the ages of 80 and 89. Males accounted for 155 (49%) older adult patients with 60 (39%) between the ages of 80 and 89.

An analysis of the type of locations where the 434 older adults fell revealed the following: The number one location where a fall occurred was in the home at 242 (56%). Next, were the residential institutions with 143 (33%), followed by 31 (7%) in commercial or public buildings, followed by two in educational institutions and the remaining 16 (4%) were at a recreational facility or on a street.

The 434 older adult fall injury patients equates to two and half times a week that an older adult fell in Bath Township. In 2007, older adult falls accounted for 133 (15%) of the injury incidents. In 2008, it was 152 (17%) incidents and in 2009 it was 149 (18%) of the injury incidents. The average conservative cost for the Bath Fire Department to respond (a one hour call duration) to a fall injury is $150.00. This cost includes only the part-time personnel who respond directly to the scene or back fill the fire station for the career personnel (salaried) and the cost of the med unit/ambulance. This equates to an annual cost of $19,500.00 for older adult falls.

Discussion

Based on the research findings and literature review, the 1,732 older adults (Sperling's Best Places, 2009) in Bath Township are at great risk of falling. Of the 2,805 EMS calls for service in Bath Township for the three-year research period, 434 (15%) were older adult falls. An older adult in Bath Township will fall every three days. One of three (33%) older adults experience a fall every year (Taigman, Tait, 2009).

There did seem to be a theme throughout the literature review and the research - if it can be predicted, it can be prevented. The American Geriatrics Society (AGC) (2001) recommends the older adult receive a "falls check up" each year. This type of message was consistent throughout the research. If the older adult is aware or warned that they could fall and what the causes of the

fall could be, there is no doubt many falls would/could be prevented. Most of these falls will happen at home while the older adult goes about their day-to-day routines (National Safety Council, 2009). This holds true in Ohio where sixty-eight percent of the 2009 older adult falls were in the home and in Bath Township where more than half of the older adult falls occurred in the home. As many as ninety-one assessments can be made in the home to help prevent a fall (Bakker, R. 2005).

To the general public, the two most serious medical events are stroke and heart attack, and most folks are aware of the risk factors associated with both. However, a fall injury can be just as serious (Howatt and Louwagie, 2009). Like a heart attack or a stroke, there are numerous risk factors that can contribute to an older adult fall. Each risk factor increases the chance of falling. If there are no risk factors, the older adult only has a ten percent chance of falling (Merk, 2005). Eighty-one percent of the research survey respondents indicated they have an older adult in their family. Ninety-four percent of those were fearful that the older adult would fall. There can be many definitions of a fall. A complex interaction of the environment combined with factors of the individual and the situation at hand, all contribute to a fall (Merk, 2005).

Although the research survey did not specifically ask each participant if their fire department responds to older adult fall injuries, it's evident that they occur in each jurisdiction based on the 1.8 million older adults who fell and required an emergency room visit in 2007 (Friese, 2008). The survey did show that only ten of the fifty-nine departments do provide pre-incident prevention and education to the older adult population. NFPA (2004) 1201, Providing Emergency Services to the Public, states the emergency service organization should develop, deliver, evaluate and revise programs specific to EMS. This certainly would include older adult falls.

It's plain to see that older adult falls are a risk for all communities. But, we often hear of fire prevention, fire education, smoke detector programs, family fire escape plans, stop-drop-and-roll, fire station tours, crawl low in smoke, fire extinguisher demonstrations and cooking safely in the kitchen. Other than the fire extinguisher demonstrations, the remainders of the programs are usually geared toward our youth. NFPA sets aside one full week every October to promote National Fire Prevention Week. Cardiopulmonary Resuscitation (CPR) is nationally known, saves lives and is taught to high school aged kids and up. Heart attack, stroke, their associated risk factors and how to prevent or at least be aware of the risks are discussed in CPR programs. When do we hear about community risk identification and reduction? The answer, we don't.

The fire service leaders who claim their organizations are an all hazard response agency - they probably are. However, have they truly identified all their risk? Probably not. Target hazards? Yes, for fire situations, but not EMS. All hazards should include EMS, specifically the risk that our older adults can fall and they will be injured. This should be an EMS target hazard. To a large extent, the general public should be responsible and accountable for their own well-being and managing their risk. Fire departments should consider renaming their current fire prevention and education bureau or division to the community risk reduction bureau or division. Fire departments should embrace the Department of Homeland Security Risk Reduction Model (Appendix C). If a fall injury reduction initiative were implemented in Bath Township and the number of older adult falls was reduced by one half, that could be an annual savings of more than $9,000.00 for the fire department's budget. Not to mention, those resources would be available for what could be a far more serious and life threatening call for service.

Recommendations

The following recommendations will address the problem that the Bath Fire Department experiences a significant number of incidents where older adults fall resulting in an injury. The fall injury reduction initiative should begin with the end in mind - reduce the number of older adult fall injuries. A short Power Point presentation (Appendix D) covering the highlights could be used for any audience to introduce the initiative.

1. Establish a steering committee to oversee the risk reduction initiative. The steering committee will instill partnerships and collaboration from stakeholders and experts in the township.

2. Implementation of the initiative will include an introduction of the five E's of Intervention for Community Risk Reduction: Education, Engineering, Economic Incentives, Enforcement and Emergency Response (DHS, 2009).

3. Identify fall risks for the older adult.

4. Identify existing fall protection and prevention in the home.

5. Identify needed fall protection and prevention in the home.

6. Immediate impacts.

    A. Share the message to increase the knowledge base of the older adults.

    B. Change behaviors and attitudes.

    C. Wow factor - this will be something new - a new service to the community.

    D. See a reduction in the number of fall injuries.

7. Long term outcomes.

    A. Continue to see a reduction in the number of fall injuries.

    B. A decrease in EMS response to older adult falls.

C. Promote the Health, Safety and Well Being of Older Adults and Improve the quality of life in Bath Township.

D. Continuously evaluate, revise as needed and sustain the initiative.

E. Maintain a commitment to the established steering committee and partnerships.

The steering committee should consist of representatives from established health care-type agencies and existing citizen-based groups, committees or associations from within the township, the township administration and safety services. The message for the initiative will be informative, educational and will cover points for pre and post fall incidents. The older adults will be encouraged to include their immediate family members, relatives, close friends or their current care giver who may be called upon to assist with pre or post fall activities. The Township's webpage, Bath Country Journal newspaper, Township Quarterly Newsletter, Board of Trustees' meetings and other informational sessions can be scheduled to communicate the initiative.

The fall injury reduction initiative for older adults will enhance Bath Fire Department's mission statement: To Protect the Health, Safety and Welfare of the Citizens of Bath Township. It will promote the exceptional customer service the citizens have come to appreciate and expect.

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Appendix A

1. What is the makeup of your department?

All Career
All Volunteer
Combination-Career and Volunteer (non-paid volunteers)
Combination-Career and Part-paid

2. Does your fire department provide Emergency Medical Services (EMS)?

Yes
No

3. Does your fire department or other governmental agency provide fall injury prevention/education (pre-incident) to the older adult (65 or older) population in your community?

Yes
No
No, another agency does not
Yes, another agency does
Not sure about another agency
If another agency, who?

4. Same question as #3, except POST INCIDENT prevention/education.

No we don't
Yes we do
We refer/notify another agency
We don't do anything post incident
If referred, to whom?

5. Does your fire department provide fire prevention/education to the older adult population in your community?

Yes, annually, part of our pub-ed program
Yes, only by request
Yes, target groups only, such as nursing homes and assisted living facilities
No

6. Does your fire department provide fire prevention/education to the school aged children in your community?

Yes
No

7. Do you have an older adult in your family (immediate or otherwise)?

Yes
No

8. If you answered yes to #7, do you fear the family member could fall?

No
Yes
Don't know enough about the person

9. If you answered yes to #7, do you know if this family member has sustained a fall within the last 12 months?

Yes, but not injured
Yes, and they were injured
No falls
Not sure

10. If you answered yes to #9, do you know if the fall could have been prevented?

Yes, it could have been
No, it could not have been
Not sure
If yes, what could have been done to prevent the fall

11. If you answered yes to #9, was there some type of post incident fall prevention/education follow up offered or provided for the family?

Yes
No
Not sure

12. If you answered yes to #11, who provided the post incident follow up?

Another family member
Primary Care Physician
Home Health Care type agency
A person from a community-based program/agency where the family resides

13. Would you agree that your fire department is an "All Hazard" response agency?

Yes
No

14. Does your fire department provide "All Hazard" mitigation (prevention; reduce or eliminate risk) for the community?

Yes
No

15. Are you familiar with the USFA's Community Risk-Reduction Model?

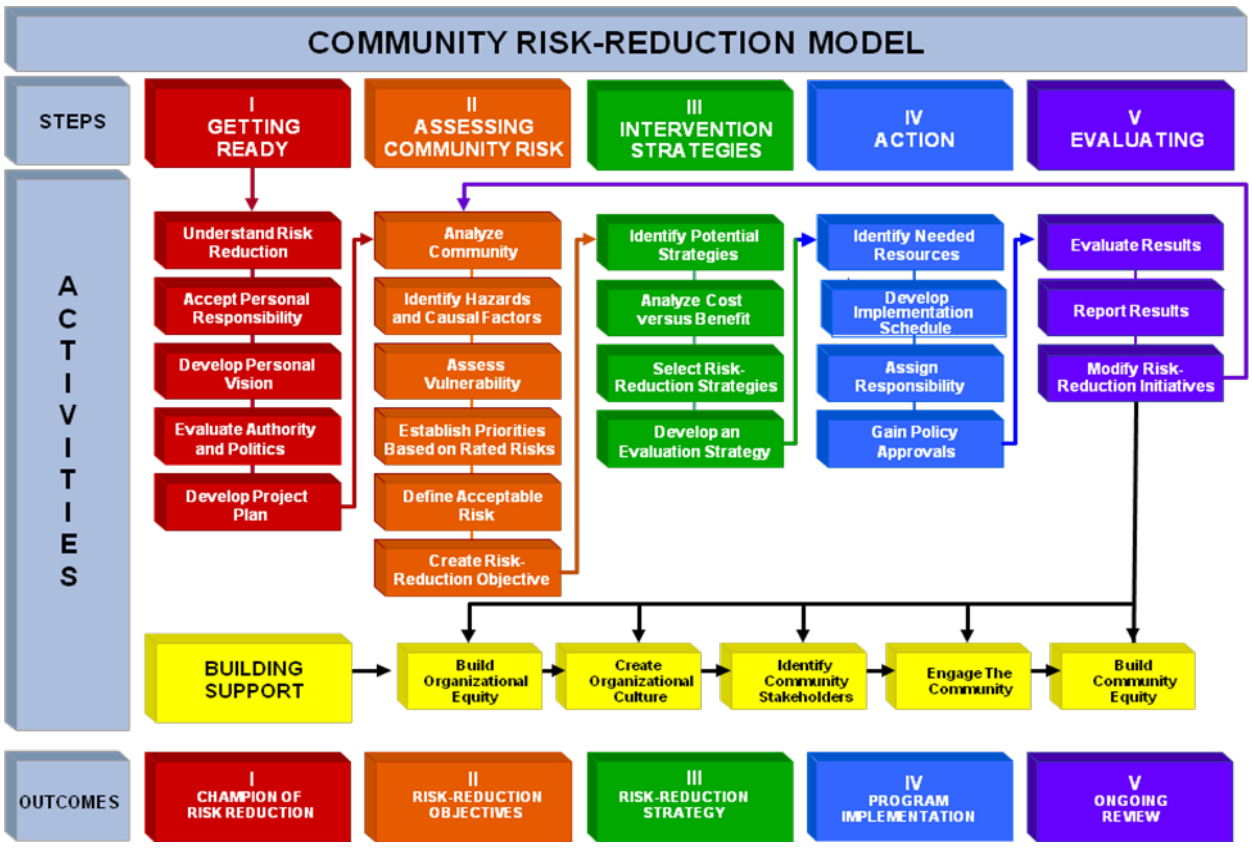
Yes
No
No, but I'll look in to it

Appendix B

1. Wolforth Fire and EMS, Texas
2. North Richmond Hills Fire Department, Texas
3. West Metro Fire Rescue, Colorado
4. Wyoming Fire EMS, Ohio
5. Bath Township Fire Department, Ohio
6. Evendale Fire Department, Ohio
7. Londonderry Fire Department, New Hampshire
8. Irving Fire Department, Texas
9. Jacksonville Fire Rescue, Florida
10. Feuerwehr Essen Fire Department, Germany
11. Unalaska Fire Rescue, Alaska
12. McHenry Township Fire Protection District, Illinois
13. Wilmette Fire Department, Illinois
14. Amarillo Fire Department, Texas
15. Owensboro Fire Department, Kentucky
16. Stony Hill Rural Fire Department, North Carolina
17. Marysville Division of Fire, Ohio
18. Sandusky Fire Department, Ohio
19. Atlantic City Fire Department, New Jersey
20. Collinsville Fire Department, Illinois
21. Rockford Fire Department, Illinois
22. Austin Fire Department, Texas
23. Copperas Grove Fire Department, Texas
24. North County Fire Protection District, California
25. Fremont Fire Department, Nebraska
26. United States Marine Corp Air Station, South Carolina
27. Currituck County Fire EMS, North Carolina
28. Command Naval Forces Regional Fire Department, Japan
29. Caldwell Fire Department, Idaho
30. Westfield Fire Department, Illinois
31. Monrovia Fire Department, California
32. Ozark Fire Department, Alabama
33. Pompano Beach Fire Rescue, Florida
34. Northwest Fire District, Arizona
35. Miramar Fire Rescue, Florida
36. Boca Raton Fire Rescue, Florida
37. White Mountain Apache Fire Rescue, Arizona
38. Las Cruces Fire Department, New Mexico
39. New County Fire Service, Georgia
40. Cedar Falls Fire Department, Iowa
41. San Marcos Fire Rescue, Texas
42. Akron Fire Department, Ohio
43. Barberton Fire Department, Ohio

44. Coventry Fire Department, Ohio
45. Clinton Fire Department, Ohio
46. Copley Fire Department, Ohio
47. Aurora Fire Department, Ohio
48. Hudson Fire Department, Ohio
49. Richfield Fire Department, Ohio
50. Stow Fire Department, Ohio
51. Cuyahoga Falls Fire Department, Ohio
52. Tallmadge Fire Department, Ohio
53. Norton Fire Department, Ohio
54. Valley Fire District, Ohio
55. Lakemore Village Fire Department, Ohio
56. Sharon Township Fire Department, Ohio
57. West Licking Fire District, Ohio
58. City of Green Fire Department, Ohio
59. Chippewa Fire Department, Ohio
60. Twinsburg Fire Department, Ohio
61. Fairlawn Fire Department, Ohio
62. Macedonia Fire Department, Ohio
63. New Franklin Fire Department, Ohio
64. Northfield Center Fire Department, Ohio
65. Northfield Village Fire Department, Ohio
66. Kent Fire Department, Ohio
67. Munroe Falls Fire Department, Ohio
68. Concord Fire Department, Ohio
69. Medina Fire Department, Ohio
70. Plain Township Fire Department, Ohio
71. Jackson Township Fire Department, Ohio
72. Forrest Park Fire Department, Ohio
73. Howland Township Fire Department, Ohio
74. Medina Township Fire Department, Ohio
75. Pleasant View Fire Department, Tennessee
76. Springfield Township Fire Department, Ohio

Appendix C (DHS, 2009)



Appendix D, Power Point Slides 1 thru 9

Slide 1

A Bath Township Risk Reduction Initiative

Slide 2

A Bath Township Risk Reduction Initiative

•*Vision: Bath Township will strive to make everyday a risk reduction day.*

•*Problem: Bath Township experiences many older adult fall injuries.*

•*Goal: To reduce the number of older adult fall injuries.*

•*"We must instill our leadership to promote an exceptional quality of life and livability in Bath Township"* – taken from the Bath Township Comprehensive Plan, 1989

Slide 3

A Bath Township Risk Reduction Initiative

•*From 1-1-2007 thru 12-31-2009, our 3 highest areas of injury risk resulted in 896 patients:*

- Falls, 557 patients or 62%
  - Of those, 434 patients or 78% were seniors (2.5 times a week)
- Motor Vehicle Crashes, 308 patients or 34%
- Struck by object, struck by person, struck by a falling object, 31 patients or 4%

Slide 4

A Bath Township Risk Reduction Initiative

- *A fall injury reduction plan for our senior citizens.*
  - Establish a steering committee.
    - Partnerships
    - Stakeholders
    - Collaborate
    - Experts
      - Akron General Health & Wellness/Injury Prevention Division
      - Home Health Care of Akron/Visiting Nurse Services
      - Akron Regional Hospital Association
      - Bath Home Owners & Business Associations
      - Bath Volunteers for Service
      - Township Administration/Advisory Council
      - Our Citizens

Slide 5

A Bath Township Risk Reduction Initiative

- *A fall injury reduction plan for our older adults – continued – Implementation & Evaluation:*
  - The steering committee will:
    - Establish objectives
    - Instill and share the "5 E's of Intervention" throughout the process
      - Education, Engineering, Economic Incentives, Enforcement, Emergency Response

Slide 6

A Bath Township Risk Reduction Initiative

- *A fall injury reduction plan for our older adults – continued – Implementation & Evaluation:*
  - Communicate, Market, Educate & Coordinate
  - Identify Fall Risks in the Home (check lists)
  - Identify Existing Fall Protection in the Home
  - Identify Needed Fall Protection/Prevention in the Home
  - Engage the family unit

Slide 7

A Bath Township Risk Reduction Initiative

- *An Impact on the Community*

  - Immediate / Short Term Impacts
    - Share our Message to Increase the Knowledge Base
    - Change Behaviors & Attitudes
    - Wow Factor
    - Bath Township will once again Raise the Bar
    - See a Reduction in the # of Fall Injuries

Slide 8

A Bath Township Risk Reduction Initiative

- *Outcomes for the Community*

- *Long Term*

  - A reduction in injuries related to falls in the home of our older adults.
  - A reduction in EMS responses related to older adult fall injuries in the home.
  - Improve the quality of life and livability in Bath Township.
  - Evaluate, Revise and Sustain the Initiative

Slide 9

A Bath Township Risk Reduction Initiative

"Coming together is a beginning; Keeping together is progress; Working together is success."

Henry Ford